



Volunteer Lake Assessment Program Individual Lake Reports

NORWAY POND, HANCOCK, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	4,546	Max. Depth (m):	5.5	Flushing Rate (yr ⁻¹)	19.2
Surface Area (Ac.):	49	Mean Depth (m):	2.5	P Retention Coef:	0.36
Shore Length (m):	1,900	Volume (m ³):	509,000	Elevation (ft):	825

TROPHIC CLASSIFICATION

Year	Trophic class
1980	MESOTROPHIC
1995	MESOTROPHIC

KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the DRAFT 2014 305(b) report on the status of N.H. waters, and are based on data collected from 2004-2013. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organizations/divisions/water/wmb/swqa/index.htm

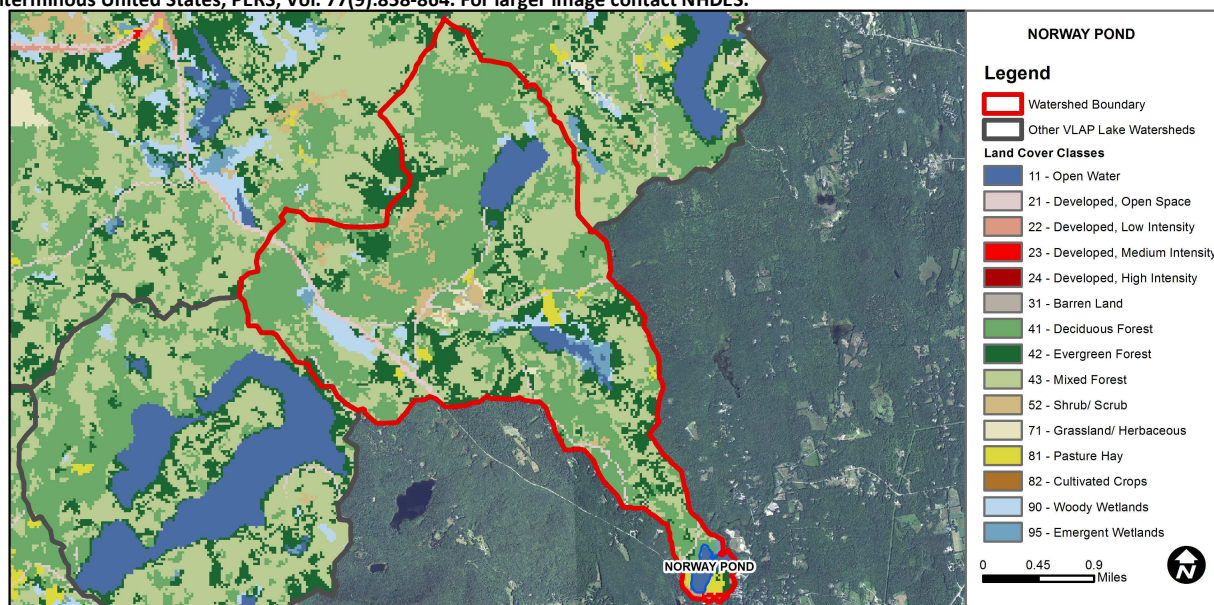
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator and the chlorophyll a indicator is okay.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Oxygen, Dissolved	Encouraging	There are < 10 samples with 0 exceedances of criteria. More data needed.
	Dissolved oxygen saturation	Cautionary	There are < 10 samples with 1 exceedance of criteria. More data needed.
	Chlorophyll-a	Good	The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator.
Primary Contact Recreation	Escherichia coli	Very Good	Where there are no geometric means, all bacteria samples are < 75% of the geometric mean. Where there are geometric means all single bacteria samples are < the SSMC and all geometric means are < geometric mean criteria.
	Chlorophyll-a	Good	There are at least 10 samples with one, but < 10% of samples, exceeding indicator.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

NORWAY POND - TOWN BEACH	Escherichia coli	Good	There are geometric means and all geometric means are < geometric mean criteria; and there has been a single sample exceedance.
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WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	4.45	Barren Land	0.09	Grassland/Herbaceous	0.57
Developed-Open Space	2.64	Deciduous Forest	41.28	Pasture Hay	1.25
Developed-Low Intensity	0.24	Evergreen Forest	14.54	Cultivated Crops	0
Developed-Medium Intensity	0.11	Mixed Forest	28.54	Woody Wetlands	2.65
Developed-High Intensity	0	Shrub-Scrub	2.55	Emergent Wetlands	1.05



VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS

NORWAY POND, HANCOCK

2014 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (Refer to Table 1 and Historical Deep Spot Data Graphics)

- ◆ **CHLOROPHYLL-A:** Chlorophyll levels were elevated in June and July and then decreased to low levels in August. The 2014 average chlorophyll level increased from 2013 and was greater than the state median. Visual inspection of historical data indicates slightly variable chlorophyll levels since 2006.
- ◆ **CONDUCTIVITY/CHLORIDE:** Deep spot and tributary conductivity levels were relatively low and approximately equal to the state median. Visual inspection of historical data indicates slightly increasing epilimnetic (upper water layer) conductivity since 2006.
- ◆ **E. COLI:** Moose Brook and Outlet E. coli levels increased greatly from July to August. August E. coli levels were greater than the state standard of 406 cts/100 mL at both stations. A significant storm event occurred prior to sampling, and tributary flows were high suggesting stormwater runoff transported bacteria-laden water to the tributaries. Localized wildlife, domestic and agricultural animals are frequently sources of elevated bacteria.
- ◆ **TOTAL PHOSPHORUS:** Epilimnetic phosphorus levels increased slightly from June to August but were within a low range. Visual inspection of historical data indicates variable epilimnetic phosphorus levels. Hypolimnetic (lower water layer) phosphorus levels increased from low levels to slightly elevated levels as the summer progressed and dissolved oxygen levels decreased indicating potential internal phosphorus loading was occurring. This could fuel the elevated algal growth. Moose Brook and Outlet phosphorus levels increased from low levels in June to slightly elevated levels in August. Significant storm events occurred in July and August and may have contributed to the higher phosphorus levels.
- ◆ **TRANSPARENCY:** Transparency worsened (decreased) from June to July as algal growth increased, and then improved (increased) in August when algal growth was lower. Average transparency remained stable from 2013 and visual inspection of historical data indicates stable transparency since 2006.
- ◆ **TURBIDITY:** Epilimnetic turbidity increased from June to July likely due to the elevated algal growth, and then decreased in August. Hypolimnetic turbidity remained relatively stable from June to August. Moose Brook turbidity increased from low levels in June to elevated levels in August following a significant storm event. Outlet turbidity levels remained fairly stable from June to August.
- ◆ **pH:** Epilimnetic pH levels were within the desirable range 6.5-8.0 units, however have historically fluctuated below desirable levels. Hypolimnetic and Outlet pH levels were less than desirable. Moose Brook pH levels fluctuated between desirable and less than desirable levels.
- ◆ **RECOMMENDED ACTIONS:** Moose Brook phosphorus, E. coli and turbidity levels were elevated in August following a significant storm event. The upstream watershed seems fairly undeveloped which leads to a wildlife as the cause, in particular, a beaver dam may have been washed out. Or, logging activities occurred upstream. Keep an eye on any activities that may be impacting water quality of the brook. Chlorophyll levels were elevated in June and July. High water levels were noted throughout the summer in the pond. If water was not being flushed at a normal rate from the pond, this may have provided excess nutrients for algae to grow. If possible, try to maintain a normal water level throughout the summer as the increased frequency and intensity of storm events may cause the water level to rise sharply and recede slowly. Agricultural and athletic fields may also be contributing nutrients. Educate landowner's on utilizing phosphate free fertilizers. Keep up the great work!

Station Name	Table 1. 2014 Average Water Quality Data for NORWAY POND								
	Alk. mg/l	Chlor-a ug/l	Cond. uS/cm	E. Coli #/100ml	Total P ug/l	Trans. m		Turb. ntu	pH
						NVS	VS		
Epilimnion	4.37	6.40	37.8		9	3.22	3.50	0.87	6.54
Hypolimnion			45.1		13			1.34	6.04
Moose Brook			34.9	627	16			1.82	6.52
Outlet			43.6	615	18			1.53	6.04

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.

Alkalinity: 4.9 mg/L

Chlorophyll-a: 4.58 mg/m³

Conductivity: 40.0 uS/cm

Chloride: 4 mg/L

Total Phosphorus: 12 ug/L

Transparency: 3.2 m

pH: 6.6

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.

Chloride: > 230 mg/L (chronic)

E. coli: > 88 cts/100 mL – public beach

E. coli: > 406 cts/100 mL – surface waters

Turbidity: > 10 NTU above natural level

pH: between 6.5-8.0 (unless naturally occurring)

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
Conductivity	N/A	Ten consecutive years of data necessary for analysis.	Chlorophyll-a	N/A	Ten consecutive years of data necessary for analysis.
pH (epilimnion)	N/A	Ten consecutive years of data necessary for analysis.	Transparency	N/A	Ten consecutive years of data necessary for analysis.
			Phosphorus (epilimnion)	N/A	Ten consecutive years of data necessary for analysis.

